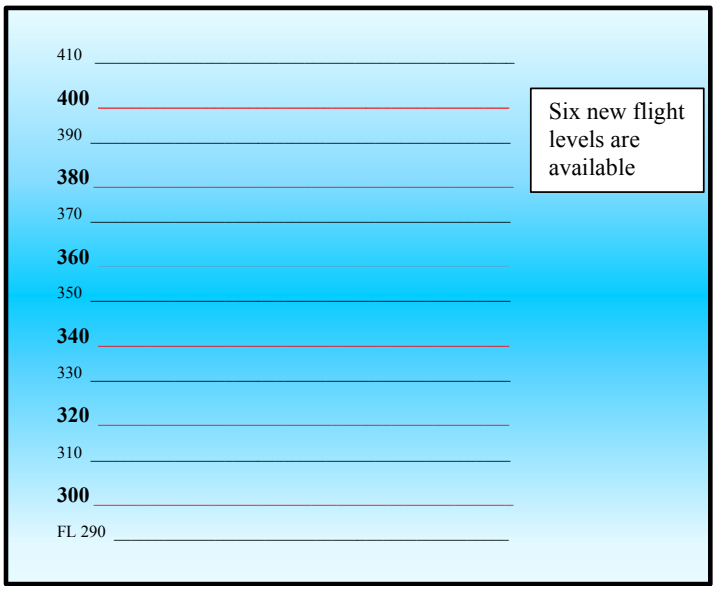
ER-4: Reduce Vertical Separation

Reduce vertical separation minima to 1,000 feet for flights operating between 29,000 feet and 41,000 feet.



Background

In US domestic airspace 1,000 foot vertical separation is applied up to FL 290 and 2,000 foot vertical separation is applied above FL 290. The Reduced Vertical Separation Minimum (RVSM) program allows 1,000 foot vertical separation to be applied between FL 290 – 410 (inclusive). RVSM was initially implemented in the North Atlantic (NAT) between FL 330-370 in March 1997. It was implemented in Pacific oceanic airspace between FL 290-390 (inclusive) in February 2000. RVSM is now implemented in the NAT, Europe, the New York Oceanic FIR portion of the West Atlantic Routes System and Australia between FL 290-410 (inclusive). (A map showing RVSM implementation status in individual areas of the world can be viewed on the FAA RVSM website discussed below).

Aircraft that have received RVSM airworthiness approval are eligible to conduct RVSM operations worldwide. The operator, however, must adopt operational policies/procedures specific to individual areas of operation prior to commencing RVSM operations in those areas. Approximately 23% of aircraft that operate in the US above flight level 290 were RVSM approved as of January 2002

The FAA maintains an RVSM website at www.faa.gov/ats/ato/rvsm1.htm. Specific information on FAA RVSM policy/procedures for aircraft and operator approval, air traffic control and monitoring can be found on that website.

Ops Change Description

The objective is to implement RVSM in the vertical stratum of the airspace of the contiguous 48 States of the United States and Alaska and in Gulf of Mexico airspace where the FAA provides air traffic services (Houston and Miami Oceanic Flight Information Regions and Jacksonville Offshore Airspace).

Benefits, Performance and Metrics

- Fuel Burn Savings. Fuel burn savings of approximately 2% per cent for US domestic operations. (When RVSM is implemented between FL 290-410, fuel burn savings are estimated to be approximately $371 million per year for US operators).
- Increased Flight Level Availability. Makes six additional flight levels (for a total of 13) available for operations between FL 290-410. (Current FL orientation schemes applied between FL 290-410 provide seven useable FL's).
- Airspace Capacity. Provides potential increase in sector capacity by enhancing traffic throughput and efficiency within en route airspace.
- Controller Flexibility. Enhances controller flexibility. Provides more options for situations such as weather re-routes and crossing traffic.
- Controller Workload. Reduces controller work load.
- Enhanced Predictability. Enhances predictability of operations by increasing the flight levels available to move aircraft allowing more aircraft to fly at requested flight level.
- Delays. Provides potential to reduce departure delays.

Scope and Applicability

The Domestic Reduced Vertical Separation Minimum (DRVSM) Team has held meetings with user advocate groups and DoD. Such meetings will continue to be scheduled periodically to inform and obtain feedback from users. Also, RVSM seminars will be held to educate users and FAA field offices on RVSM program requirements. (See the FAA RVSM website for seminar announcements and schedule).

- The proposal to implement RVSM between FL 290-410 (inclusive) in December 2004 is considered to be a feasible option and the FAA is developing its plans accordingly.

Key Decisions

- Implementation dates and vertical stratum.
- Policy for accommodation of non-RVSM approved DoD and air ambulance aircraft .

Key Tasks and Risks

- Rulemaking. FAA publication of an NPRM in late April 2002 and a Final Rule in June 2003.
- Cost/Benefit and Implementation Schedule. General user acceptance of an implementation plan and schedule that enables the significant majority of aircraft to be engineered to RVSM compliance. (ATP, AFS).
- Accommodation of Un-Approved Aircraft. Acceptance of policies for accommodation of non-RVSM approved DoD and air ambulance aircraft (ATP, AFS).
- Wake Turbulence/Mountain Wave Effects. Development of procedures to mitigate the effect of wake turbulence and mountain wave effect (ATP, AFS).
- Flight Standards Field Resources. Development of plans for Flight Standards field office approval of large numbers of aircraft and operators (AFS).
- Aircraft Certification Office Resources. Development of plans for Aircraft Certification Office resources to approve individual unique (non-group) airframes for RVSM (AIR, AFS).
- Single Altimeter Equipage. FAA exploring option for turbo-propeller aircraft operated under part 91 and equipped with a single RVSM compliant altimeter to conduct RVSM operations in domestic US airspace and, where authorized, in foreign airspace.

  Note: FAA has established policy to allow DoD aircraft equipped with a single RVSM compliant altimeter to conduct domestic US RVSM operations.
- Coordination with Canada/Mexico. Coordination of implementation plan with Canada and Mexico (ATP, AFS, ACT).
- Safety Analysis. Acceptability of safety analysis to support the DRVSM implementation decision (ATP, AFS, ACT).
- Operator Fleet Readiness. Operators must complete required aircraft and operator approval actions in the period leading up to implementation (AFS, AIR).
- TCAS Version 7.0. Aircraft equipped with TCAS II and used in RVSM operations will be required to equip with TCAS II, Version 7.0 (or a later version) in accordance with the part 91 Appendix G. (TCAS equipage is **not** required for RVSM operations. TCAS equipage requirements are published in regulations not related to RVSM).
- NAS Modification. Modify NAS capabilities such as conflict alert to make them effective at FL's above 290 where 1,000 ft vertical separation is applied. (ATP).
- Pre and Post Implementation Monitoring. Pre- and post implementation monitoring program to assess key factors related to operational safety: data base of approved operators/aircraft; system to monitor aircraft altitude-keeping performance (AFS, ACT).
- Airspace Re-Design. Coordinate DRVSM program with High Altitude Airspace Re-design Program (ATP, ATA).